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514 Rec'd REC'D CT/PTO 29 SEP 1999

SEQUENCE LISTING

<110> Suntory Limited

<120> Process for producing peptides using a helper peptide

<130> F962

<150> JP 10-032272
<151> 1998-01-30

<160> 24

<210> 1
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence adjacent to a site cleaved by enterokinase

<400> 1
Asp Asp Asp Lys
1

<210> 2
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence adjacent to a site cleaved by blood coagulation Factor Xa

<400> 2
Ile Glu Gly Arg
1

<210> 3
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence containing a site cleaved by
renin

<400> 3
Pro Phe His Leu Leu Val Tyr
1 5

<210> 4
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223>

<400> 4
Val Asp Asp Asp Asp Lys
1 5

<210> 5
<211> 6
<212> PRT
<213> Artificial Sequence

<220>

<223> Amino acid sequence of helper peptide

<400> 5

Gly Cys His His His His
1 5

<210> 6

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence containing a chemically cleaved site

<400> 6

Pro Gly Gly Arg Pro Ser Arg His Lys Arg
1 5 10

<210> 7

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of helper peptide

<400> 7

His Arg His Lys Arg Ser His His His His
1 5 10

<210> 8

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence containing a site cleaved by Kex2 protease

<400> 8

Ser Asp His Lys Arg

1 5

<210> 9

<211> 23

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of containing a position cleaved by OmpT

<400> 9

Gln Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His His

1 5 10 15

Arg Trp Gly Arg Ser Gly Ser

20

<210> 10

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence containing a position cleaved by OmpT

<400> 10

Gln Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His His
1 5 10 15

Gly Ser Gly Ser
20

<210> 11
<211> 69
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence coding for an amino acid sequence containing a site cleaved by OmpT

<400> 11
cag atg cat ggt tat gac gcg gag ctc cgg ctg tat cgc cgt cat cac 48
Gln Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His His
1 5 10 15
cgg tgg ggt cgt tcc gga tcc 69
Arg Trp Gly Arg Ser Gly Ser
20

<210> 12
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence containing a site cleaved by OmpT

<400> 12
Gln Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His His
1 5 10 15
Arg Trp Gly Arg Ser Gly Ser
20

<210> 13
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence coding for an amino acid sequence containing a site cleaved by OmpT

<400> 13
tggttatgac gcggagctcc gcctgtatcg ccgtcatcac ggttccg 47

<210> 14
<211> 55
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence coding for an amino acid sequence containing a site cleaved by OmpT

<400> 14
gatccggaac cgtgatgacg gcgatacagg cggagctccg cgtcataacc atgca 55

<210> 15
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 15
gactcagatc ttcctgaggc cgat 24

<210> 16
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 16
aaaggtacct tccgcattgcc gcggatgtcg agaagg 36

<210> 17
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 17
aggccaggaa ccgtaaaaag 20

<210> 18
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 18
aaaatgcattt gcatcgtaac cgtgcattt 29

<210> 19

<211> 627
<212> DNA
<213> Artificial Sequence

<220>
<223> Nucleotide sequence coding for a fusion protein comprising GLP-1, helper peptide and β -galactosidase protective peptide

<400> 19

ccaggcttt acactttatg cttccggctc gtatgttgc tgaaattgtg agcggataac 60
aatttcacac aggaaacagc t atg acc atg att acg gat tca ctg gcc gtc 111
Met Thr Met Ile Thr Asp Ser Leu Ala Val
1 5 10

gtt tta caa cgt aaa gac tgg gat aac cct ggc gtt acc caa ctt aat 159
Val Leu Gln Arg Lys Asp Trp Asp Asn Pro Gly Val Thr Gln Leu Asn
15 20 25

cgc ctt gca gca cat ccc cct ttc gcc agc tgg cgt aat agc gac gac 207
Arg Leu Ala Ala His Pro Pro Phe Ala Ser Trp Arg Asn Ser Asp Asp
30 35 40

gcc cgc acc gat cgc cct tcc caa cag ttg cgc agc ctg aat ggc gaa 255
Ala Arg Thr Asp Arg Pro Ser Gln Gln Leu Arg Ser Leu Asn Gly Glu
45 50 55

tgg cgc ttt gcc tgg ttt ccg gca cca gaa gcg gtg ccg gca agc ttg 303
Trp Arg Phe Ala Trp Phe Pro Ala Pro Glu Ala Val Pro Ala Ser Leu
60 65 70

ctg gag tca gat ctt cct gag gcc gat act gtc gtc gtc ccc tca aac 351
Leu Glu Ser Asp Leu Pro Glu Ala Asp Thr Val Val Val Pro Ser Asn
75 80 85 90

tgg cag atg cac ggt tac gat gcg atg cat ggt tat gac gcg gag ctc 399
Trp Gln Met His Gly Tyr Asp Ala Met His Gly Tyr Asp Ala Glu Leu
95 100 105

cgc ctg tat cgc cgt cat cac ggt tcc gga tcc cct tct cga cat ccg 447
Arg Leu Tyr Arg Arg His His Gly Ser Gly Ser Pro Ser Arg His Pro
110 115 120

cgg cat gcg gaa ggt acc ttt acc agc gat gtg agc tcg tat ctg gaa 495
Arg His Ala Glu Gly Thr Phe Thr Ser Asp Val Ser Ser Tyr Leu Glu
125 130 135
ggt cag gcg gca aaa gaa ttc atc gcg tgg ctg gtg aaa ggc cgt ggt 543
Gly Gln Ala Ala Lys Glu Phe Ile Ala Trp Leu Val Lys Gly Arg Gly
140 145 150
taagtcgaca gccccctaa tgagcgggct ttttttctc ggaattaatt ctcatgtttg 603
acagcttatac atcgataaagc ttta 627

<210> 20
<211> 154
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of a fusion protein comprising
GLP-1, helper peptide and β -galactosidase
protective peptide

<400> 20
Met Thr Met Ile Thr Asp Ser Leu Ala Val Val Leu Gln Arg Lys Asp
1 5 10 15
Trp Asp Asn Pro Gly Val Thr Gln Leu Asn Arg Leu Ala Ala His Pro
20 25 30
Pro Phe Ala Ser Trp Arg Asn Ser Asp Asp Ala Arg Thr Asp Arg Pro
35 40 45
Ser Gln Gln Leu Arg Ser Leu Asn Gly Glu Trp Arg Phe Ala Trp Phe
50 55 60
Pro Ala Pro Glu Ala Val Pro Ala Ser Leu Leu Glu Ser Asp Leu Pro
65 70 75 80
Glu Ala Asp Thr Val Val Val Pro Ser Asn Trp Gln Met His Gly Tyr
85 90 95
Asp Ala Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His
100 105 110
His Gly Ser Gly Ser Pro Ser Arg His Pro Arg His Ala Glu Gly Thr
115 120 125

Phe Thr Ser Asp Val Ser Ser Tyr Leu Glu Gly Gln Ala Ala Lys Glu
130 135 140

Phe Ile Ala Trp Leu Val Lys Gly Arg Gly
145 150

<210> 21
<211> 187
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of a fusion protein comprising
GLP-1, helper peptide and β -galactosidase
protective peptide

<400> 21
Met Thr Met Ile Thr Asp Ser Leu Ala Val Val Leu Gln Arg Lys Asp
1 5 10 15
Trp Asp Asn Pro Gly Val Thr Gln Leu Asn Arg Leu Ala Ala His Pro
20 25 30
Pro Phe Ala Ser Trp Arg Asn Ser Asp Asp Ala Arg Thr Asp Arg Pro
35 40 45
Ser Gln Gln Leu Arg Ser Leu Asn Gly Glu Trp Arg Phe Ala Trp Phe
50 55 60
Pro Ala Pro Glu Ala Val Pro Ala Ser Leu Leu Glu Ser Asp Leu Pro
65 70 75 80
Glu Ala Asp Thr Val Val Val Pro Ser Asn Trp Gln Met His Gly Tyr
85 90 95
Asp Ala Pro Ile Tyr Thr Asn Val Thr Tyr Pro Ile Thr Val Asn Pro
100 105 110
Pro Phe Val Pro Thr Glu Pro His His His His His Gly Arg Gln
115 120 125
Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His His Arg
130 135 140
Trp Gly Arg Ser Gly Ser Pro Ser Arg His Lys Arg His Ala Glu Gly
145 150 155 160

Thr Phe Thr Ser Asp Val Ser Ser Tyr Leu Glu Gly Gln Ala Ala Lys
165 170 175

Glu Phe Ile Ala Trp Leu Val Lys Gly Arg Gly
180 185

<210> 22

<211> 184

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of a fusion protein comprising
GLP-1, helper peptide and β -galactosidase
protective peptide

<400> 22

Met Thr Met Ile Thr Asp Ser Leu Ala Val Val Leu Gln Arg Lys Asp
1 5 10 15

Trp Asp Asn Pro Gly Val Thr Gln Leu Asn Arg Leu Ala Ala His Pro
20 25 30

Pro Phe Ala Ser Trp Arg Asn Ser Asp Asp Ala Arg Thr Asp Arg Pro
35 40 45

Ser Gln Gln Leu Arg Ser Leu Asn Gly Glu Trp Arg Phe Ala Trp Phe
50 55 60

Pro Ala Pro Glu Ala Val Pro Ala Ser Leu Leu Glu Ser Asp Leu Pro
65 70 75 80

Glu Ala Asp Thr Val Val Val Pro Ser Asn Trp Gln Met His Gly Tyr
85 90 95

Asp Ala Pro Ile Tyr Thr Asn Val Thr Tyr Pro Ile Thr Val Asn Pro
100 105 110

Pro Phe Val Pro Thr Glu Pro His His His His His Gly Arg Gln
115 120 125

Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His His Gly
130 135 140

Ser Gly Ser Pro Ser Arg His Lys Arg His Ala Glu Gly Thr Phe Thr
145 150 155 160

Ser Asp Val Ser Ser Tyr Leu Glu Gly Gln Ala Ala Lys Glu Phe Ile
165 170 175

Ala Trp Leu Val Lys Gly Arg Gly
180

<210> 23
<211> 184
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of a fusion protein comprising
GLP-1, helper peptide and β -galactosidase
protective peptide

<400> 23
Met Thr Met Ile Thr Asp Ser Leu Ala Val Val Leu Gln Arg Lys Asp
1 5 10 15
Trp Asp Asn Pro Gly Val Thr Gln Leu Asn Arg Leu Ala Ala His Pro
20 25 30
Pro Phe Ala Ser Trp Arg Asn Ser Asp Asp Ala Arg Thr Asp Arg Pro
35 40 45
Ser Gln Gln Leu Arg Ser Leu Asn Gly Glu Trp Arg Phe Ala Trp Phe
50 55 60
Pro Ala Pro Glu Ala Val Pro Ala Ser Leu Leu Glu Ser Asp Leu Pro
65 70 75 80
Glu Ala Asp Thr Val Val Val Pro Ser Asn Trp Gln Met His Gly Tyr
85 90 95
Asp Ala Pro Ile Tyr Thr Asn Val Thr Tyr Pro Ile Thr Val Asn Pro
100 105 110
Pro Phe Val Pro Thr Glu Pro His His His His His Gly Arg Gln
115 120 125
Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His His Gly
130 135 140
Ser Gly Ser Pro Ser Arg His Pro Arg His Ala Glu Gly Thr Phe Thr
145 150 155 160

Ser Asp Val Ser Ser Tyr Leu Glu Gly Gln Ala Ala Lys Glu Phe Ile
165 170 175

Ala Trp Leu Val Lys Gly Arg Gly
180

<210> 24

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence containing a site cleaved by
Kex2 Protease

<400> 24

Ser Cys His Lys Arg

1 5